Claims

The invention claimed is:

1. A method for the synthesis of an alpha-pentagalloylglucose (α-PGG) precursor comprising the steps of:

a) suspending a highly reactive acylation agent and an acylating catalyst in a donor solvent;

b) adding α-D-glucose or an analogue thereof to the mixture; and

c) reacting the mixture at room temperature for a time sufficient for reaction to occur;

wherein the reaction product comprises the α-PGG precursor or analogue thereof.

2. The method of claim 1 further comprising the steps of:

d) evaporating the solvent from the mixture of step (c);

e) taking up the residue in an second solvent;

f) filtering the residue and second solvent mixture; and

g) evaporating off the second solvent.

3. The method of claim 2 further comprising the step of hydrogenating the product of step (g) to yield α-PGG or an analogue thereof.

4. The method of claim 1 wherein the highly reactive acylating agent is an acid chloride.

5. The method of claim 1 wherein the acylating catalyst is a pyridine derivative.

6. The method of claim 5 wherein the acylating catalyst is 4-(*N,N*-dimethylamino)pyridine (DMAP).

7. The method of claim 1 wherein the analogue of α-D-glucose selected from the group consisting of α-D-glucose, hexoses, pentoses, and tetroses.

8. The method of claim 7 wherein the analogue of α-D-glucose is selected from the group consisting of α-D-glucose, hexoses, pentoses, and tetroses wherein the ring oxygen of the α-D-glucose, hexoses, pentoses, and tetroses has been replaced with an atom selected from the group consisting of carbon, nitrogen, and sulfur.

9. The method of claim 7 wherein the analogue of α-D-glucose is a hexose.

10. The method of claim 9 wherein the hexose is selected from the group consisting of galactose, mannose, idose, talose, altrose, allose, gulose, fructose, and combinations thereof.

11. The method of claim 7 wherein the analogue of α-D-glucose is a pentose.

12. The method of claim 11 wherein the pentose is selected from the group consisting of xylose, ribose, arabinose, lyxose, and combinations thereof.

13. The method of claim 7 wherein the analogue of α-D-glucose is a tetrose.

14. The method of claim 13 wherein the tetrose is selected from the group consisting of threose, erythrose, and combinations thereof.

15. The method of claim 1 wherein the mixture of step (c) is allowed to react for several hours.

16. The method of claim 1 wherein the donor solvent is selected to produce a ratio α-PGG to β-PGG (α:β ratio) of at least 90:10.

17. The method of claim 16 wherein the donor solvent is selected to produce an α:β ratio of at least 95:5.

18. The method of claim 1 wherein the donor solvent is selected from the group consisting of acetonitrile, 1,4-dioxane, and tetrahydrofuran.

19. The method of claim 18 wherein the donor solvent is acetonitrile.

20. The method of claim 2 wherein the second solvent is toluene.

21. The method of claim 2 wherein the second solvent is heated.

22. The method of claim 1 wherein the ratio α-PGG to β-PGG (α:β ratio) is greater than 90:10.

23. The method of claim 22 wherein the α:β ratio is greater than 95:5.